Name: Answer Key Date:

9.5 Completing the Square Review

Solve for the variable by completing the square. You must show all your work. Round to the nearest hundredth.

1.) $a^2 + 2a - 3 = 0$

$a^2+2a = 3$ $+1$ $+1$

$a^2+2a+1 = 4$

$\sqrt{(a+1)^2} = \sqrt{4}$

$a+1 = \pm 2$

-1 -1

$a = 1, -3$

2.) $a^2 - 2a + 8 = 0$

$a^2-2a = -8$ $+1$ $+1$

$a^2-2a+1 = -7$

$\sqrt{(a-1)^2} = \sqrt{-7}$

no solution

3.) $k^2 + 8k + 12 = 0$

$K^2+8K = -12$

$+16$ $+16$

$K^2+8K+16 = 4$

$\sqrt{(K+4)^2} = \sqrt{4}$

$K+4 = \pm 2$

-4 -4

$K = -2, -6$

4.) $3x^2 + 20x + 36 = 4$

$\frac{3x^2}{3} + \frac{20x}{3} = \frac{-32}{3}$

$x^2 + \frac{20}{3}x = -\frac{32}{3}$ $+\frac{100}{9}$ $+\frac{100}{9}$

$x^2 + \frac{20}{3}x + \frac{100}{9} = \frac{4}{9}$

$\sqrt{(x+\frac{10}{3})^2} = \sqrt{\frac{4}{9}}$

$x + \frac{10}{3} = \pm \frac{2}{3}$

$x = -\frac{8}{3}, -4$

5.) $m^2 + 13m + 22 = 7$

$m^2+13m = -15$

$+42.25$ $+42.25$

$m^2+13m+42.25 = 27.25$

$\sqrt{(m+6.5)^2} = \sqrt{27.25}$

$m+6.5 = \pm 5.22$

$x = -1.28, -11.72$

6.) $\frac{4v^2}{4} + \frac{16v}{4} = \frac{65}{4}$

$v^2+4v = 16.25$

$v^2+4v+4 = 20.25$

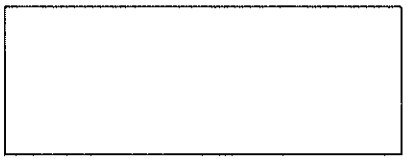
$\sqrt{(v+2)^2} = \sqrt{20.25}$

$v+2 = \pm 4.5$

-2 -2

$V = 2.5, -6.5$

7.) The rectangle shown has an area of 27 square inches. What is the value of x?



x in

x + 6 in

$(x+6)x = 27$

$x^2+6x = 27$

$x^2+6x+9 = 36$

$\sqrt{(x+3)^2} = \sqrt{36}$

$x+3 = \pm 6$

-3 -3

$x = 3$ inches -9

Write the polynomial in vertex from of a parabola. Identify the vertex for each equation.

8.) ~~$x^2+12x+20=y$~~ $y = x^2+12x+20$

-20 -20

$y-20 = x^2+12x$

$y+16 = x^2+12x+36$

$y+16 = (x+6)^2$

$y = (x+6)^2 - 16$

vertex: $(-6, -16)$

9.) ~~$x^2-8x+21=y$~~

$y = x^2-8x+21$

$y-21 = x^2-8x$

$y-5 = x^2-8x+16$

$y-5 = (x-4)^2$

$y = (x-4)^2 + 5$

vertex: $(4, 5)$